OW-2002-0017
Wastewater Handbook
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U.S. Environmental Protection Agency

Underground Injection Control Program

Shallow Injection Wells (Class V)

The wells in this class are as diverse as they are similar. This category came about after all the easy definable wells were put into classes I through IV. In general, EPA did not have definite information on these wells when it published the UIC regulations in the late 1970s. This classification includes large septic tanks as well as very sophisticated experimental wells.

- NEW **Class V Final Determination**

  EPA is announcing a final determination for all sub-classes of Class V injection wells not included in a 1999 rulemaking (64 FR 68546). The Agency has determined that additional federal requirements are not needed for these wells at this time, and existing federal underground injection control (UIC) regulations are adequate to prevent Class V injection wells from endangering underground sources of drinking water. EPA proposed this determination in May 2001 (60 FR 22971). The final determination is based on the Agency's evaluation of existing data collected for The Class V Underground Injection Control Study (EPA/816-R-99-014), additional sources of information found in the public docket, and public comment on the proposed determination.

  - **Federal Register Notice** (June 7, 2002)
    - Read Online
    - PDF (162 KB)
  - **Final Determination Fact Sheet** (PDF 292 KB)
  - **EPA's proposed determination for managing Class V Injection Wells**
    - Fact Sheet
    - Federal Register Notice (May 7, 2001)
      - Read Online
      - PDF

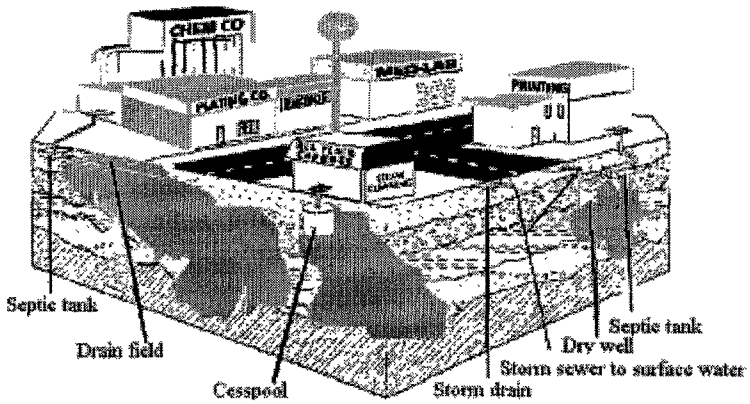
- How a shallow disposal system on your property affects you

  This website will help owners and operators of Class V wells understand and comply with the minimum federal requirements for all Class V wells. Pages with the new minimum federal requirements for motor vehicle waste disposal wells and large capacity cesspools (Class V Rule) have information on how to determine if an operator has a motor vehicle waste disposal well or large capacity cesspool, and how to comply with the new minimum federal requirements. The site also includes links to: the source water page; state and regional contacts for the UIC Program and the Source Water Program; the fact sheets developed for the well types in the study; and other helpful websites.

- **Class V Regulation and Implementation**: (December, 1999) The rule sets new requirements for two types of Class V wells: large-capacity cesspools and motor vehicle waste disposal wells

9 pgs.

- National Study of Class V wells (September, 1999): a comprehensive national study of 22 types of Class V wells
- NDWAC Working Group on UIC and Source Water Protection
- Videos about Class V injection wells: EPA has developed two videos that describe contamination problems that can result from Class V wells and how communities and businesses can prevent problems from occurring.



You will need Adobe Acrobat Reader to view the Adobe PDF files on this page. See EPA's PDF page for more information about getting and using the free Acrobat Reader.

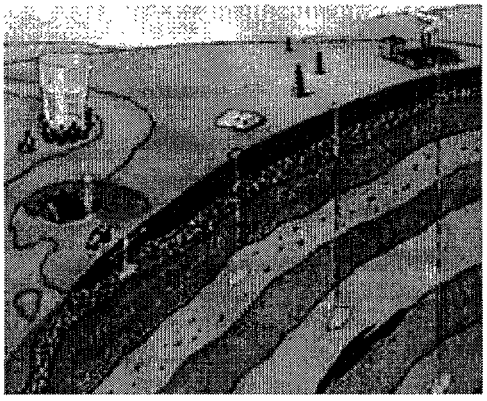
Last updated on Thursday, June 13th, 2002
URL: http://www.epa.gov/safewater/uic/classv.html

U.S. Environmental Protection Agency

Underground Injection Control Program

Underground Injection Control (UIC) Program

Federal UIC Directory (Find the Fed to help you!)



The UIC Program works with state and local governments to oversee underground injection of waste in order to prevent contamination of drinking water resources. Some of the wastes the UIC program regulates include:

- Over 9 billion gallons of hazardous waste every year
- Over 2 billion gallons of brine from oil and gas operations every day
- Automotive, industrial, sanitary and other wastes that are injected into shallow aquifers.

Regional UIC web pages

Region 3 ~ Region 4 ~ Region 5
Region 6 ~ Region 10

What is the UIC Program?

Classes of Injection Wells
EPA has defined five classes of wells type of waste injected into them.

- Study of the Risks Associated Class I Underground Injection (EPA 816-R-01-007 / March 2(

Class V Wells Initiative
Information about protecting sources drinking water by complying with new rules on shallow wells used to inject a variety of wastes.

Study on Hydraulic Fracturing of C Methane Wells

State UIC Programs

Source Water Protection Tribal Pac

Regulations and Guidance

UIC Technical Work Group

UIC Reporting Forms (7520s)

Last updated on Wednesday, July 17th, 2002
URL: http://www.epa.gov/safewater/uic.html

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Classes of Injection Wells

Regulatory Definitions of Injection Wells (§144.6)

The UIC Program provides standards, technical assistance and grants to State governments to regulate injection wells in order to prevent them from contaminating drinking water resources. EPA defines the five classes of wells according to the type of fluid they inject and where the fluid is injected. EPA has published regulations related to the siting, drilling, construction and operation of many types of injection wells.

Class I wells are technologically sophisticated and inject hazardous and non-hazardous wastes below the lowermost underground source of drinking water (USDW). Injection occurs into deep, isolated rock formations that are separated from the lowermost USDW by layers of impermeable clay and rock.

Class II wells are oil and gas production brine disposal and other related wells. Operators of these wells inject fluids associated with oil and natural gas production. Most of the injected fluid is brine that is produced when oil and gas are extracted from the earth (about 10 barrels of brine for every barrel of oil).

Class III wells are wells that inject super-heated steam, water, or other fluids into formations in order to extract minerals. The injected fluids are then pumped to the surface and the minerals in solution are extracted. Generally, the fluid is treated and re-injected into the same formation. More than 50 percent of the salt and 80 percent of the uranium extraction in the U.S. is produced this way.

Class IV wells inject hazardous or radioactive wastes into or above underground sources of drinking water. These wells are banned under the UIC program because they directly threaten public health.

In general, owners and operators of most new Class I, II and III injection wells are required to:

- Site the wells in a location that is free of faults and other adverse geological features;
- Drill to a depth that allows the injection into formations that do not contain water that can potentially be used as a source of drinking water. These injection zones are confined from any formation that may contain water that may potentially be used as a source of drinking water;
- Build to inject through an internal pipe (tubing) that is located inside another pipe (casing). This outer pipe has cement on the outside to fill any voids occurring between the outside pipe and the hole that was bored for the well (borehole). This allows for multiple layers of containment of the potentially contaminating injection fluids;
- Test for integrity at the time of completion and every five years thereafter (more frequently for hazardous waste wells, §146.68(d));
- Monitor continuously to assure the integrity of the well.

	Operators of Class I wells injecting hazardous waste are required to demonstrate that the waste will never return to the surface or impact an underground source of drinking water (for 10,000 years). These wells inject at 4,000 feet below the surface or more. Over 9 billion gallons of hazardous waste is injected into wells each year in the US.
Class V wells are injection wells that are not included in the other classes. Some Class V wells are technologically advanced wastewater disposal systems used by industry, but most are "low-tech" wells, such as septic systems and cesspools. Generally, they are shallow and depend upon gravity to drain or "inject" liquid waste into the ground above or into underground sources of drinking water. Their simple construction provides little or no protection against possible ground water contamination, so it is important to control what goes into them.	The largest number of injection wells are shallow wells that inject non-hazardous fluids into very shallow aquifers that are or can be used as sources of drinking water. Some of the wells in this category are: • Drainage wells in industrial setting that can receive surface runoff contaminated with a variety of pollutants; • Septic tank systems and dry-wells used in automotive shops that receive fluids from repair and maintenance bays; • Cesspools that receive sewage from a community; • Agricultural drainage wells that may receive water contaminated with pesticides and fertilizers.

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State UIC Programs
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EPA Proposes to Continue with its Existing Approach for Managing Class V Injection Wells

EPA 816-F-01-009
April 2001

What is a Class V injection well?

A well is any bored, drilled, or driven shaft, or dug hole that is deeper than wide at its widest surface dimension; an improved sinkhole; or a subsurface fluid distribution system.

Typically, Class V injection wells are shallow "wells," such as septic systems and drywells, used to place nonhazardous fluids directly below the land surface. However, Class V wells can be deep, highly sophisticated wells. The U.S. Environmental Protection Agency (EPA) estimates there are more than 650,000 Class V wells in the United States. Class V wells are located in every state, especially in unsewered areas where the population is likely to depend on groundwater for its drinking water source.

What are Class V injection wells used for?

Class V wells are a convenient and inexpensive means to dispose of a variety of nonhazardous fluids. Some examples of Class V wells are agricultural drainage wells, storm water drainage wells, large capacity septic systems, sewage treatment effluent wells, spent brine return flow wells, mine backfill wells, aquaculture waste disposal wells, solution mining wells, in-situ fossil fuel recovery wells, special drainage wells, experimental wells, aquifer remediation wells, geothermal electric power wells, geothermal direct heat wells, heat pump/air conditioning return flow wells, saltwater intrusion barrier wells, aquifer recharge and aquifer storage and recovery wells, subsidence control wells, and industrial wells. For facilities that generate nonhazardous wastes, Class V wells provide for disposal when there is no access to a sewer system. Class V wells are also an alternative to discharges to surface water.

The effective management of Class V wells is vital because of their large number, the wide variety of fluids discharged into them, and because most accessible fresh water is stored underground in aquifers. Aquifers serve as drinking water sources for 86 percent of public water systems in the United States. These aquifers also supply private drinking water and agricultural wells, feed our lakes, and recharge our streams and rivers, particularly during dry periods.

What Federal regulatory requirements now apply to Class V injection wells?

All Class V wells are regulated by Underground Injection Control (UIC) Programs, and states and EPA Regions already have the authority to prevent any Class V well from endangering underground sources of drinking water. Current federal requirements prohibit any injection activity that may endanger underground sources of drinking water (40 CFR Part 144). Also, the current federal regulations require all owners and operators of Class V wells to provide inventory information (location, legal contact, nature of the injection activity, etc.) to their state UIC authority.

In December 1999, EPA published new requirements for capacity cesspools and motor vehicle waste disposal wells, two types of Class V wells. New and existing large capacity cesspools and new motor vehicle waste disposal wells are banned nationwide. Existing motor vehicle waste disposal wells are banned in groundwater protection areas and other state-designated sensitive groundwater areas. However, owners and operators of existing motor vehicle waste wells may seek waivers from the ban and apply for permits that would allow them to continue operating their wells, provided the waste meets drinking water standards at the point of injection.

What is EPA's notice of proposed determination?

In September 1999, EPA completed *The Class V Underground Injection Control Study* a comprehensive study of most types of Class V wells. The *Study* consisted of two major components: (1) information collection, which involved a comprehensive literature search, state and EPA regional data collection, requests to the public for data, and peer review; and (2) inventory modeling to estimate the number of storm water drainage wells and large capacity septic systems, two types of wells believed to be widespread but for which adequate inventory information was particularly lacking.

Today's proposed determination addresses all the Class V well types not addressed in the 1999 final rule. EPA proposes that existing federal regulations for Class V wells are adequate to protect drinking water supplies, and that additional federal UIC regulations are not needed at this time to prevent Class V wells from endangering underground sources of drinking water. This proposed determination is based on the Agency's evaluation of the data collected as part of *The Class V Underground Injection Control Study*, information on industrial wells, and other information placed in the public docket for comment.

Nevertheless, this determination does not end EPA's obligations, requirements, and actions to prevent Class V wells from endangering underground sources of drinking water (USDW). Class V UIC Program Directors have many obligations and authorities under the Safe Drinking Water Act (SDWA) to ensure the protection of USDWs. The Agency will continue to meet these obligations and implement these authorities for all Class V wells.

What is EPA's

EPA's management plan for Class V injection wells includes

overall plan for managing the risks posed by Class V injection wells?

the following major components:

1. **Implement Existing Class V Regulations** An ongoing effort by state and EPA Underground Injection Control Programs to implement existing regulations:

- Identification of Class V facilities
- Effective and appropriate use of existing regulatory authorities such as permitting, enforcement actions, and wells closure
- Providing increased technical assistance to bring endangering wells into compliance
- EPA will continue to develop tools and work cooperatively with states to ensure that well owners and operators remain in compliance

2. **Implement New Regulations** An intense state and EPA effort to implement the Class V "Phase 1" Rule, promulgated in December of 1999, addressing motor vehicle waste disposal wells and large capacity cesspools through:

- Outreach
- Training
- Technical Assistance
- Compliance Assistance

3. **Educate Well Operators** An ongoing outreach effort by state and EPA UIC Programs to educate operators regarding their responsibilities under federal and state requirements, and provide information on best management practices.

4. **Exploring Non-regulatory Approaches** A continuous effort by EPA to work closely with targeted industries that may use Class V injection wells, to establish voluntary standards and practices to protect public health.

5. **Preparing for Future Actions** Today's proposed determination does not preclude future action under our UIC authority if the Agency determines that additional regulatory action is needed. In the normal course of program operations, EPA will continue to work with states, industries and environmental organizations to collect and evaluate data on Class V wells and their risks.

How do I get more information?

For more information, contact the Safe Drinking Water Hotline at 1-800-426-4791 (email: hotline-sdwa@epa.gov). You can also get well-specific fact sheets and other information on Class V wells, including information on the Class V Rule from the EPA website: http://www.epa.gov/safewater/uic/classv.html. For technical questions contact farrelly.joan@epa.gov.

How can I comment on the proposed determination?

EPA will accept public comments on the proposed determination until July 6, 2001. Address written comments to the UIC Class V, W-98-5 Comment Clerk, Water Docket (MC-4101); U.S. Environmental Protection Agency; 1200 Pennsylvania Avenue, NW, Washington, DC 20460.

Comments may be submitted electronically to ow-docket@epa.gov.

More information about underground injection control wells.

Last updated on Thursday, June 13th, 2002
URL: http://www.epa.gov/safewater/uic/classvdetermination.html